SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS

[0001] All documents cited herein are incorporated by reference in their entirety.

RELATED APPLICATIONS, FROM WHICH PRIORITY IS CLAIMED

[0002] This application incorporates by reference in its entirety U.S. provisional patent application 60/462,218, Attorney Reference No. PP20474.001, filed on Apr. 10, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/462,465, Attorney Reference No. PP20480.001, filed on Apr. 11, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/462,418, Attorney Reference No. PP20480.002, filed on Apr. 12, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/462,748, Attorney Reference No. PP20480.003, filed on Apr. 13, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/463,109, Attorney Reference No. PP20480.004, filed on Apr. 14, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/463,460, Attorney Reference No. PP20480.005, filed on Apr. 15, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/463,668, Attorney Reference No. PP20480.006, filed on Apr. 16, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/463,983, Attorney Reference No. PP20480.007, filed on Apr. 17, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/463,971, Attorney Reference No. PP20480.008, filed on Apr. 18, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/464,899, Attorney Reference No. PP20480.009, filed on Apr. 22, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/464,838, Attorney Reference No. PP20507.001, filed on Apr. 22, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/465,273, Attorney Reference No. PP20518.001, filed on Apr. 23, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/465,535, Attorney Reference No. PP20518.002, filed on Apr. 24, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/468,312, Attorney Reference No. PP20480.010, filed on May 5, 2003 via Express Mail with the US post office, and U.S. provisional patent application 60/473,144, Attorney Reference No. PP20480.011, filed on May 22, 2003, U.S. provisional patent application 60/495,024, Attorney Reference No. PP20480.012, filed on Aug. 14, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/505,652, Attorney Reference No. PP20480.013, filed on Sep. 23, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/510,781, Attorney Reference No. PP20480.014, filed on Oct. 11, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/529,464, Attorney Reference No. PP20480.015, filed on Dec. 11, 2003 via Express Mail with the US post office, U.S. provisional patent application 60/536,177, Attorney Reference No. PP20480.016, filed on Jan. 12, 2004 via Express Mail with the US post office, and U.S. provisional patent application 60/_____, Attorney Reference No. PP20480.017, filed on Apr. 7, 2004 via Express Mail with the US post office.

FIELD OF THE INVENTION

[0003] The invention relates to nucleic acids and proteins from Severe Acute Respiratory Syndrome (SARS) Virus. These nucleic acids and proteins can be used in the preparation and manufacture of vaccine formulations for the treatment or prevention of SARS. The invention also relates to diagnostic reagents, kits (comprising such reagents) and methods which can be used to diagnose or identify the presence or absence of a SARS virus in a biological sample. The invention also relates to methods for the treatment or prevention of SARS utilizing small molecule viral inhibitors and combinations of small molecule viral inhibitors and kits for the treament of SARS.

BACKGROUND OF THE INVENTION

[0004] An outbreak of a virulent respiratory virus, now known as Severe Acute Respiratory Syndrome (SARS), was identified in Hong Kong, China and a number of other countries around the world in 2003. Patients typically had symptoms including fever, dry cough, dyspnea, headache, and hypoxemia. Isolates of the SARS virus appear to have homology with at least the RNA polymerase gene of several known coronaviruses. A phylogenetic analysis of this homology is presented in Peiris et al., "Coronavirus as a possible cause of severe acute respiratory syndrome", *Lancet,* published online Apr. 8, 2003 at http://image.thelancet-.com/extras/03art3477web.pdf, incorporated herein by reference in its entirety. Other sequenced fragments of the SARS virus genome appear to overlap with the open reading frame 1b of coronaviruses. See, Drosten et al., "Identification of a Novel Coronavirus in Patients with Severe Acute Respiratory Syndrome", *New England Journal of Medicine,* published online at http://www.nejm.org on Apr. 10, 2003, incorporated herein by reference in its entirety.

[0005] The Genome Science Center in British Colombia, Canada published on its website (http://www.bcgsc.ca/bioinfo/SARS/) a draft genome assembly of 29,736 base pairs of a virus believed to be a SARS virus, referred to as the TOR2 isolate. This draft genome assembly is given herein as SEQ ID NO: 1.

[0006] The Centers for Disease Control (CDC) published a nucleotide sequence of a SARS-CoV strain (SEQ ID NO: 2) on its website (http://www.cdc.gov/ncidod/sars/pdf/nucleoseq.pdj). The CDC has also published a phylogenetic tree of the predicted N, S and M proteins (attached as **FIG. 6**). This tree places the SARS virus outside any of the previously known coronavirus groups.

[0007] There is a growing need for prophylactic or therapeutic vaccines against the SARS virus as well as diagnostic and screening methods and compositions to identify the presence of the virus in, e.g., mammalian tissue or serum.

SUMMARY OF THE INVENTION

[0008] The invention relates to nucleic acids and proteins from Severe Acute Respiratory Syndrome (SARS) virus. These nucleic acids and proteins can be used in the preparation and manufacture of vaccine formulations for the treatment or prevention of SARS. Such vaccine formulations may include an inactivated (or killed) SARS virus, an attenuated SARS virus, a split SARS virus preparation and a recombinant or purified subunit formulation of one or